Dr. Kefeng Guo

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Bio:

Kefeng Guo received his B.S. degree from Beijing Institute of Technology, Beijing, China in 2012, and the Ph.D. degree in Army Engineering University, Nanjing, China in 2018. He is a Lecturer in School of Space Information, Space Engineering University. He has authored or coauthored nearly 70 research papers in international journals and conferences. His research interests focus on cooperative relay networks, MIMO communications systems, multiuser communication systems, satellite communication, hardware impairments, cognitive radio, NOMA technology and physical layer security. He was a recipient of exemplary Reviewer for **IEEE Transactions on Communications** in 2022. He was the recipient of the Outstanding Ph.D. Thesis Award of Chinese Institute of Command and Control in 2020. He also was the recipient of the Excellent Ph.D. Thesis Award of Jiangsu Province, China in 2020. He also serves as an Editor on the Editorial Board for the **EURASIP Journal on Wireless Communications and Networking**. He was the Guest Editor for the special issue on Integration of Satellite-Aerial-Terrestrial Networks of **Sensors**, also the Guest Editor for the special issue on Recent Advances and Challenges of Satellite and Aerial Communication Networks of **Electronics**.

Dr. Guo has been the TPC member of many IEEE sponsored conferences, such as IEEE ICC, IEEE GLOBECOM and IEEE WCNC.

Speech Title: Deep Reinforcement Learning-based Energy Efficiency Optimization for RIS-aided Integrated Satellite-Aerial-Terrestrial Relay Networks

Speech Abstract: Integrated satellite-aerial-terrestrial relay networks (ISATRNs) have been considered as a promising architecture for next-generation networks, where high altitude platform (HAP) is pivotal in these integrated networks. In this paper, we introduce a novel model for HAP-based ISATRNs with mixed FSO/RF transmission mode, which incorporates unmanned aerial vehicles (UAVs) equipped with reconfigurable intelligent surfaces (RISs) to dynamically reconfigure the propagation environment and fulfill the massive access requirements of ground users. Our aim is to maximize the system ergodic rate by joint optimizing the UAV trajectory, RIS phase shift, and active transmit beamforming matrix under the constraint of UAV energy consumption. To solve this intractable problem, a deep reinforcement learning (DRL)-based energy efficient optimization scheme by utilizing an improved long short-term memory (LSTM)-double deep Qnetwork (DDQN) framework is proposed. Numerical results demonstrate the superiority of our proposed algorithm over the traditional DDQN algorithm, on single-step exploration average reward values and other evaluation metrics.